

**Abstract of the disclosure**

A method and an apparatus for estimating an optimal dosage of bleaching agent  
5 to be used in a process for producing pulp of a required brightness value involve a set of wood chip properties characterizing the wood chips as estimated by a measurement system. Corresponding wood chip properties data are fed at the inputs of a predictive model (10) including a neural network (12), as well as an initial dosage value of the bleaching agent. The predictive model (10) generates a  
10 predicted brightness value of pulp to produce from the inspected wood chips, to estimate the optimal bleaching agent dosage for which the predicted brightness value substantially reaches the required brightness value. A method and system for controlling the bleaching of pulp are respectively based on the same estimation method and apparatus.